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EXAMINER	
STEVENS, THOMAS H	
ART UNIT	**PAPER NUMBER**
2123	

DATE MAILED: 08/24/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/734,968	BALLUS, THOMAS A.	
	Examiner	Art Unit	
	Thomas H. Stevens	2123	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *12 December 2000*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-22* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-22* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *12 December 2000* is/are: a)☐ accepted or b)☒ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

1. Claims 1-22 were examined.

Trademarks

2. The use of the trademark on page 8, lines 24-25 of the specification has been noted in this application. It should be capitalized wherever it appears and be accompanied by the generic terminology. Although the use of trademarks is permissible in patent applications, the proprietary nature of the marks should be respected and every effort made to prevent their use in any manner, which might adversely affect their validity as trademarks.

Drawings

3. Figures 2-4 disclose a Windows® -based operating application, NORDFAB® ; and thus should be labeled as prior art.

Claim Rejections - 35 USC § 112

4. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter, which the applicant regards as his invention.

5. Claim 4 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. The words "assumed" and "desired" are vague and indefinite.

6. Furthermore, regarding claim12, the phrase "standard ductworth" renders the claim indefinite because the claim includes elements not actually disclosed (those encompassed by "standard ductworth"), thereby rendering the scope of the claims unascertainable.

Claim Interpretation

7. Office personnel are to give claims their **"broadest reasonable interpretation"** in light of the supporting disclosure. *In re Morris,* 127 F.3d 1048, 1054-55, 44 USPQ2d 1023, 1027-28 (Fed. Cir. 1997). Limitations appearing in the specification but not recited in the claim are not read into the claim. *In re Prater,* 415 F.2d 1393, 1404-05, 162 USPQ 541, 550-551(CCPA 1969). See *also *In re Zletz,* 893 F.2d 319, 321-22, 13 USPQ2d 1320, 1322(Fed. Cir. 1989) ("During patent examination the pending claims must be interpreted as broadly as their terms reasonably allow") .... The reason is simply that during patent prosecution when claims can be amended, ambiguities should be recognized, scope and breadth of language explored, and clarification imposed .... An essential purpose of patent examination is to fashion claims that are precise, clear, correct, and unambiguous. Only in this way can uncertainties of claim scope be removed, as much as possible, during the administrative process. **The examiner interprets the invention's software design features (e.g., the 3D coordinate system) as flexible to any procedure or series of steps to fabricate any commercial structure while adhering to industry design specification standards.**

Subsequently, the examiner interprets the "drop tube" as a z-direction base or start tube (pg. 5, lines 5-8). (Note: figure 5/7 was missing was not scanned into IFW or was not originally submitted).

Claim Rejections - 35 USC § 103

8. The factual inquiries set forth in *Graham* **v.** *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

9. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

10. Claims 1-22 are rejected under 35 U.S.C. 103 (a) as obvious by Howe et al, "A Network-based kit-of-parts Virtual Building System" (1997), in view of Dai et al. (U.S. Patent (1995)). Howe teaches virtual Internet-based xyz coordinate design program for real-time modification and implementation. Although this 3D CAD program is geared

At the time the invention, it would have been obvious to one of ordinary skill in the art to use Howe et al. to modify Dai et al since it would have been advantageous for company personnel, in station and on site, to have real-time access to specified pipes so personnel can initiate changes so as to a avoid unnecessary and costly redesigns.

Claim 1. Method for automating the design of a ducting system for a fluid comprising the steps of entering boundary data (15, 17, 19, 20) identifying boundary conditions of the ducting system, into a data processing (Howe: pg. 4 paragraphs: "Point" and "Fabrication" and pg. 5, paragraph 2.3.1; Dai: abstract with figures 3A and 3B); system, which boundary data comprises positional information (17) in a three dimensional installation space and magnitude of partial fluid flow (19, 20) for each of at least one component terminal connection, through which fluid is exchanged with the ducting system, wherein the fluid flow through said at feast one component terminal connection has a common orientation, and positional information (15) in the three dimensional installation space of at least one main terminal connection (Dai: column 2 ,lines 47-61), through which the total fluid flowing through the at least one component terminal connection is routed, determining design data (27, 43) by applying an optimization algorithm (Howe: abstract: step (L)) to said boundary data using said data recessing system, which design data comprises an optimum layout (27) of said ducting system in the three dimensional installation space including an identification of all required ducting components (43) for building the ducting system, selected from a collection of standard

ductwork primitives (51), and having said data processing system communicate the design data (27, 43) to an external recipient.

Claim 2. Method for automating the design of a ducting system according to claim 1(Howe: pg. 4 paragraphs: “Point” and “Fabrication” and pg. 5, paragraph 2.3.1; Dai: abstract with figures 3A and 3B), where said boundary data contains a uniform fluid velocity value (13) corresponding to a uniform desired flow speed of the fluid in all parts of the ducting system (Dai: column 6, lines 60-65; column 8, lines 11-16).

Claim 3. Method for automating the design of a ducting system according to claim 1 or 2, (Howe: pg. 4 paragraphs: “Point” and “Fabrication” and pg. 5, paragraph 2.3.1; Dai: abstract with figures 3A and 3B) wherein said boundary data contains information determining said common orientation of the fluid flow through said at least one component terminal connection.

Claim 4. Method for automating the design of a ducting system according to any of claims 1 to 3, (Howe: pg. 4 paragraphs: “Point” and “Fabrication” and pg. 5, paragraph 2.3.1; Dai: abstract with figures 3A and 3B) wherein a required throughput capacity of at least one pipe element (41), which is contained in said required ducting components (43), is calculated by the data processing means considering they position of the pipe element (41) within said optimum layout (27) of the ducting system (Dai: column 2, lines

31-34); and the magnitude of said partial fluid flow (19, 20) for each of the at least one component terminal connection, while a uniform desired flow speed of the fluid in all parts of the ducting system is assumed.

Claim 5. Method for automating the design of a ducting system according to any of claims 1 to 4(Howe: pg. 4 paragraphs: “Point” and “Fabrication” and pg. 5, paragraph 2.3.1; Dai: abstract with figures 3A and 3B), wherein said boundary data (15, 17, 19, 20) contains information identifying a z-dimension (12), corresponding to the height of a trunk plane above the floor level of the three dimensional installation space, which floor level is defined by the x- and y- axes of the coordinate system and in which trunk plane a trunk pipe system (26) is configured, which provides connections to one main terminal location (15) and at least one drop to(17) which is the location defined by tie projection of the at least one component terminal connection along the z-axis into the trunk plane (Dai: column 7, lines 20-31 and columns 11 and 12).

Claim 6. Method for automating the design of a ducting system according to claim 5(Howe: pg. 4 paragraphs: “Point” and “Fabrication” and pg. 5, paragraph 2.3.1; Dai: abstract with figures 3A and 3B), wherein said optimum layout (27) of paid ducting system is determined by optimizing the configuration of said trunk pipe system (26), which contains at least one straight trunk pipe (28), wherein the orientations allowed for said at least one straight trunk pipe (28) are restricted to the directions of the x and the y-axis of the coordinate system (Dai: column 7, lines 20-31 and columns 11 and 12).

Claim 7. Method for automating the design of a ducting system according to claim 5 or 6 (Howe: pg. 4 paragraphs: "Point" and "Fabrication" and pg. 5, paragraph 2.3.1; Dai: abstract with figures 3A and 3B), wherein said optimization algorithm to determine said optimum layout (27) of said trunk pipe system (26) comprises the steps of dividing said drops (17) into two drop groups (29, 30) according to the location of drops (17) relative to said main terminal location (15) in x-direction, dividing each drop group (29, 30) into two side groups (31, 32) according to the location of drops (17) within said drop groups (29, 30) relative to said main terminal location (15) in y-direction, applying a subdividing routine for subdividing input groups into at least one output group to each side group (31, 32), while the output group is named level 1 group (33), by assigning each drop (17) separated from any other drop (17) within the same input group by a distance of equal or less than a predetermined parameter to individual output groups, determining a group center coordinate (34) for each output group by averaging the coordinates of said drops (17) contained in said output group, iteratively applying said subdividing routine to said at least one output group of the respective prior routine, as long as a pair of drops (17) separated by a distance of equal or less than a respective parameter value, which is supplied from a list of predetermined parameters of decreasing value, exists, obtaining a layout A of said trunk pipe system (26) by applying a routine for laying out the pipelines comprising the steps of laying out horizontal pipelines (35) originating from said main terminal location (15) in both directions, providing branching points (36) to vertical pipelines (37), connecting said at least one level 1 group (33) to said trunk pipe system (26), while said vertical pipelines (37) are positioned is such way, that their

pathways include said *group* center coordinate (34) of said respective level 1 group (33), and adding orthogonal pipelines to said vertical pipelines (37), connecting the single drops (17) to said trunk pipe system (2f) either is directly or via branching points (38) of further group bevel distribution systems, providing access to the remaining drops via a grid of orthogonal pipelines, whsle the pathways of said orthogonal pipelines include said group center coordinates of the remaining groups, selecting said optimum layout (27) of the trunk pipe system (26) by choosing the layout providing the shorter total length of all pipeline segments between said layout A of said trunk pipe system (26) *and* layout B obtained by rotating the design area 14 by 90 degrees, configuring the pipes according to said routine for laying out the pipelines, and rotating the design area 14 back by 90 degrees, configuring the pipes according to said routine for laying out the pipelines, and rotating the design area 14 back by 90 degrees (Dai: column 7, lines 20-31 and columns 11 and 12).

Claim 8. Method for automating the design of a ducting system according to any of claims to 7, (Howe: pg. 4 paragraphs: "Point" and "Fabrication" and pg. 5, paragraph 2.3.1; Dai: abstract with figures 3A and 3B) wherein said method contains the step of modifying any aspect of said design data (27,43) through a user interface, if needed, after said design data is determined by the data processing system (Dai: column 7, lines 20-31 and columns 11 and 12).

Claim 9. Method for automating the design of a ducting system according to any of claims 1 to 8 (Howe: pg. 4 paragraphs: "Point" and "Fabrication" and pg. 5, paragraph 2.3.1; Dai: abstract with figures 3A and 3B), wherein said step of having the data prong system communicate the design data (27, 43) to an external recipient results in a visual display of the geometry of said optimum layout (27) to scale Ito the physical layout of the desired ducting system including visualizations of said at least one component terminal connection, of said at least one main terminal orientations, of at least one elbow device (40) if required by the layout, each of which is interfacing a pair of pipe elements (41) of different orientations, which pipe elements (43) are contained in said required ducting components (45), and of at least one branching device (39) if required by the layout, each of which is connecting at least 3 pipe elements (41) (Dai: column 7, lines 20-31 and columns 11 and 12).

Claim 10. Method for automating the design of a ducting system according to claim 9, (Howe: pg. 4 paragraphs: "Point" and "Fabrication" and pg. 5, paragraph 2.3.1; Dai: abstract with figures 3A and 3B) wherein said step of having the data processing system communicate the design data (27, 43) to an external recipient results in a visual display of a list (43) of said required ducting components including their prices (50), which list is based on said visual display of the optimum layout (27) (Dai: column 7, lines 20-31 and columns 11 and 12).

Claim 11. Method for automating the design of a ducting system according to any of claims 1 to 10 (Howe: pg. 4 paragraphs: "Point" and "Fabrication" and pg. 5, paragraph 2.3.1; Dai: abstract with figures 3A and 3B) herein said method can be utilized via the Internet through the use of web browsing software (Howe: pg. 6).

Claim 12. Means for automating the design of a ducting system for a fluid comprising data entry means (Howe: pg. 4 paragraphs: "Point" and "Fabrication" and pg. 5, paragraph 2.3.1; Dai: abstract with figures 3A and 3B), used to identify positional information (17) in a three dimensional installation space and magnitude of partial fluid flow (19, 20) for each of at least one component terminal connection, through which fluid is exchanged with the ducting system, wherein the fluid flow through said at least one component terminal connection has a common orientation, and position information (15) in the three dimensional installation space of at least one main terminal connection, through which the total fluid flowing through the at least one component terminal connection is routed, a standard ductwork data base (51) containing a collection of standard ductwork primitives (Dai: column 2, lines 32-34) processing means applying optimization criteria in order to determine design data (27, 43), comprising an optimum layout (27) of said ducting system in the three dimensional installation space including identification of all required ducting components (43) for building the ducting system, selected from said standard ductwork data base (51), and data output means, communicating said design data (27, 43) to an external from said standard ductwork

data base (51) and data output means, communicating said design data (27,43) to an external recipient (Dai: column 7, lines 20-31 and columns 11 and 12).

Clam 13, Means for automating the design of a ducting system according to claim 12, (Howe: pg. 4 paragraphs: "Point" and "Fabrication" and pg. 5, paragraph 2.3.1; Dai: abstract with figures 3A and 3B) wherein said data entry means are used to identify a uniform fluid velocity value (13) corresponding to a uniform desired flow speed of the fluid in all parts of the ducting system (Dai: column 6, lines 60-65).

Claim 14. Means for automating the do of a ducting system according to claim 12 or 13, (Howe: pg. 4 paragraphs: "Point" and "Fabrication" and pg. 5, paragraph 2.3.1; Dai: abstract with figures 3A and 3B) to wherein said data entry means are used to identify said common orientation of the fluid flow through said at least one component terminal connection (Dai: column 4, lines 50-55).

Claim 15. Means for automating the design of a ducting system according to any of Claims 12 to 14, (Howe: pg. 4 paragraphs: "Point" and "Fabrication" and pg. 5, paragraph 2.3.1; Dai: abstract with figures 3A and 3B) wherein a required throughput capacity of at least one pipe element (41), which is contained in said required ducting components (43), is calculated by the data processing means considering the position of the pipe element (41) within said optimum layout (27) of the ducting system, the magnitude of said partial fluid flow (19, 20) for each of the at least one component

terminal connection (Dai: column 4, lines 50-55), while a uniform desired flow speed of the fluid in ail parts of the ducting system is assumed.

Claim 16. Means for automating the design of a ducting system according to any of claims 12 to 15, (Howe: pg. 4 paragraphs: "Point" and "Fabrication" and pg. 5, paragraph 2.3.1; Dai: abstract with figures 3A and 3B) wherein said data entry means are used to identify a z-dimension (12), corresponding to the height of a trunk plane above the floor level of the three dimensional installation space, which floor level is defined by the x- and y- axes of the coordinate system and in which trunk plane a trunk pipe system (26) is configured, which provides connections to one main terminal location (15) and at least one drop (17), which is the location defined by the projection of the at least one component terminal connection along the z-axis into the trunk plane (Dai: column 7, lines 20-31 and columns 11 and 12).

Claim 17. Means for automating the decision of a ducting system according to claim 16, (Howe: pg. 4 paragraphs: "Point" and "Fabrication" and pg. 5, paragraph 2.3.1; Dai: abstract with figures 3A and 3B) wherein said data processing means determine said optimum layout (27) of said ducting system by optimizing the configuration of said trunk pipe system (26), which contains at least one straight trunk pipe (28), wherein the orientations allowed for said at least one straight trunk pipe (28) are restricted to the directions of the x and the y- axis of the coordinate system (Dai: column 7, lines 20-31 and columns 11 and 12).

Claim 18. Means for automating the design of a ducting system according to claim 16 or 17, (Howe: pg. 4 paragraphs: "Point" and "Fabrication" and pg. 5, paragraph 2.3.1; Dai: abstract with figures 3A and 3B) wherein said optimization criteria used to determine said\optimum layout (27) said trunk pipe system (26) are based on an algorithm comprising the steps of dividing said drops (17) into two drop groups (29, 30) according to the location of drops (17) relative to said main terminal location (15) in x-direction, dividing each drop group (29. 30) into two side groups (31. 32) according to the location of drops (17) within said drop groups (29, 30) relative to said main terminal location (15) in y-direction, applying a subdividing routine for subdividing input groups into at least one output group to each side group (31, 32), while the output group is named level 1 group (33), by assigning each drop (17) separated from any other drop (17) within the same input group by a distance of equal or Less than a predetermined parameter to individual output groups, determining a group center coordinate (34) for each output group by averaging the coordinates of said drops (17) contain said output group, iteratively applying said subdividing routine to said at least one output group of the respective prior routine, as long as a pair of drops (17) separated by a distance of equal or less than a respective parameter value, which is supplied from a list of predetermined parameters of decreasing value, exists, obtaining a layout A of said trunk pipe system (26) by applying a routine for laying out the pipelines comprising the steps of Laying out horizontal pipelines (35) originating from said main terminal location (15) in both directions, providing branching points (36) to vertical pipelines (37), connecting said at least one level group (33) to said trunk pipe system (26), while said vertical pipelines

(37) are positioned is such way, that their pathways include said group center coordinate (34) of said respective level 1 group (33), and adding orthogonal pipelines to said vertical pipelines (37), connecting the single drops (17) to said trunk pipe system (26) either directly or via branching prints (36) of further group level distribution systems, providing access to the remaining drops via a grid of orthogonal pipelines, while the pathways of said orthogonal pipelines include said group center coordinates of the remaining groups, selecting said optimum layout (27) of the trunk pipe system (28) by choosing the layout providing the shorter total length of all pipeline segments between said layout of said trunk pipe system (26) and layout obtained by rotating the design area 14 by 90 degrees, configuring the pipes according to said routine for laying out the pipelines and rotating the design area 14 back by 90 degrees (Dai: column 7, lines 20-31 and columns 11 and 12).

Claim 19. Means for automating the design of a dulling system according to arty of claims 12 to 18, (Howe: pg. 4 paragraphs: "Point" and "Fabrication" and pg. 5, paragraph 2.3.1; Dai: abstract with figures 3A and 3B) wherein said means comprise a user interface, used to modify any aspect of said design data (27, 43), if needed.

Claim 20. Means for automating the design of a ducting system according to any of claims 12 to 19 (Howe: pg. 4 paragraphs: "Point" and "Fabrication" and pg. 5, paragraph 2.3.1; Dai: abstract with figures 3A and 3B), wherein said data output means visually display the geometry of said optimum is layout (27) to scale to the physical layout of the

desired ducting system including visualizations of said at least one component terminal connection, of said at least one main terminal connection, of at least one elbow device (40) if required by the layout, each of which is interfacing a pair of pipe elements (41) of different orientations, which pipe elements (41) are contained in said required ducting components (43), and of at least one branching device (39) if required by the layout, each of which is connecting at east 3 pipe elements (41) (Dai: column 7, lines 20-31 and columns 11 and 12).

Claim 20. Means for automating the design of a ducting system according to any of claims 12 to 19, (Howe: pg. 4 paragraphs: “Point” and “Fabrication” and pg. 5, paragraph 2.3.1; Dai: abstract with figures 3A and 3B) wherein said data output means visually display the geometry of said optimum is layout (27) to scale to the physical layout of the desired ducting system including visualizations of said at least one component terminal connection, of said at least one main terminal Connection, of at least one elbow device (40) if required by the layout, each of which is interfacing a pair of pipe elements (41) of different orientations, which pipe elements (41) are contained in said required ducting components (43), and of at least one branching device (39) if required by the layout, each of which is connected at least 3 pipe elements (41) (Dai: column 7, lines 20-31 and columns 11 and 12).

Claim 21. Means for automating the design of a ducting system according to claim 20, (Howe: pg. 4 paragraphs: “Point” and “Fabrication” and pg. 5, paragraph 2.3.1; Dai:

abstract with figures 3A and 3B) wherein said data output means visually display a list (43) of said required ducting components including their prices (Howe: pg. 5, section 2.3.2, lines 4-13) (50), which list is based on said visual display of the optimum layout (27).

Claim 22. Means for automating the design of a ducting system according to any of the claims 12 to 21(Howe: pg. 4 paragraphs: "Point" and "Fabrication" and pg. 5, paragraph 2.3.1; Dai: abstract with figures 3A and 3B), wherein said means can be utilized via the Internet though the use of web browsing software (Howe: pg. 6).

Correspondence Information

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Mr. Tom Stevens whose telephone number is (703) 305-0365, Monday-Friday (8:00 am- 4:30 pm) or contact Supervisor Mr. Kevin Teska at (703) 305-9704. The fax number for the group is 703-872-9306.

Any inquires of general nature or relating to the status of this application should be directed to the Group receptionist whose phone number is (703) 305-3900.

August 18, 2004

THS

KEVIN J. TESKA
SUPERVISORY
PATENT EXAMINER